

TO: Richard Metzler, John Dower and Ray Wells

CC: Luanne Freund and John Skaryak

FROM: Terry Cloonan, Scott Health and Safety, Monroe, NC, USA

DATE: May 31, 2001

SUBJECT: Comments for Submission Under NIOSH Docket Number – 002, Potential Standards or Guidelines for Respiratory Protective Devices Used to Protect Emergency Response Workers Against Chemical, Biological and Radiological (CBR) Agents.

1. References.

- a. National Personal Protective Technology Laboratory Mission and Strategic Goal Power Point Slides, Richard Metzler, Undated, 2001.
- b. Federal Register/Vol. 66, No. 55/ Wednesday, March 21, 2001/Notices, National Institute for Occupational Safety and Health Announcement of Public Meeting to Discuss Potential Standards or Guidelines for Respiratory Protective Devices Used to Protect Emergency Response Workers Against Chemical, Biological and Radiological Agents.
- c. Joint NIST/NIOSH/ SBCCOM Stakeholder Meeting Agenda Concerning Current Understanding of Threats, Relevant Standards and User Needs in Responding to Nuclear, Chemical, Biological and Radiological (NCBR) Agents, Richlin Ballroom, Edgewood, Maryland, April 17-18, 2001.
- d. SBCCOM Notional Test Matrix for Evaluating NBC Protective Respirators for Domestic Preparedness Applications, Wayne Davis, Undated, 2001.
- e. NIOSH/SBCCOM Respiratory Standards Health Effects/Breakthrough Concentrations, Wayne Davis, SBCCOM, Undated, 2001.
- f. Scott Health and Safety, Scott Technologies Company, Input to the Public Meeting dated April 12, 2001.
- g. Fire and Emergency Services Technologies Innovation Conference Booklet, SBCCOM, Natick Soldier Center, Massachusetts, 28-30 March 2001.
- h. Weapons of Mass Destruction (WMD) Terrorism Preparedness & Response Conference & Exhibition, NDIA and IAB, Salt Lake City, Utah, April 30 – May 2, 2001.
- i. 2001 Department of Energy Respiratory Protection Administrator's Session, West Valley Demonstration Project, DOE and Westinghouse, West Valley, NY, May 14, 15 & 16, 2001.
- j. Inspection Report, US Department of Energy, Office of Inspector General, Office of Inspections, Inspection of the Purchase of Protective Force Respirators, DOE, April, 2001.
- k. Washington Post, Cheney to Lead Anti-Terrorism Plan Team, New FEMA Office Will Coordinate Response Efforts of More Than 40 Agencies Officials Say, Vernon Loeb, Washington Post, May 9, 2001.

- l. Nuclear, Biological and Chemical Industry Group (NBCIG) Industry Day, Fort McNair Officer's Club, Arlington, VA, May 24, 2001.
 - m. US Capitol Police and Scott Health and Safety Live Weapons Fire Product Compatibility Demonstration, Fort Meade, Range 5, VA, May 25, 2001.
 - n. Canadian Broadcast Corporation, WMD and Its Effects, CBC Radio, Fulfillment By Bowdens, March 25, 2001.
 - o. The InterAgency Board (IAB) for Equipment Standardization & InterOperability 2000 Annual Report and 2001 Standardized Equipment Listing (SEL), IAB Arlington, VA, April, 2001.
 - p. Ataxia: The Chemical and Biological Terrorism Threat and the US Response, Amy E. Smithson and Leslie-Anne Levy, The Henry L. Stimson Center, Report N0. 35, October 2000.
 - q. US Department of Justice, Office of Justice Programs, OSLDPS, Incident Response to Terrorist Bombings: Awareness Level Course, New Mexico Institute Of Mining and Technology, Version 7/10/00, Morganton, NC, May 21, 2001.
 - r. US Department of Justice, Office of Justice Programs, OSLDPS, Law Enforcement Response to Weapons of Mass Destruction Incidents, WMD Response Guidebook, Participant Manual, Louisiana State University Academy of Counter-Terrorist Education, September, 1999.
 - s. National Domestic Preparedness Office Special Bulletin # 6, WMD Threats: Sample Guidelines Reissue, January 12, 2000.
 - t. House Armed Services Committee Statement of Mr. Mark Wong, Deputy Coordinator for Counter-Terrorism, US Department of State, Washington, DC, May 22, 2001.
 - u. House Armed Services Committee Statement of Mr. Sam Brinkley, Policy Advisor, Weapons of Mass Destruction, Office of the Coordinator for Counter-Terrorism, US Department of State, Washington, DC, May 22, 2001.
 - v. National Fire & Rescue Magazine, The Threat of Anthrax, Craig Levy, Sr., May/June 2001.
2. The above 22 current references indicate the magnitude of this issue.
 3. The following comments and recommendations are submitted in accordance with reference 1. b.
 - a. NFPA 1981 prohibits the use of APR for fire fighting and recognizes the SCBA as the only form of respirator protection for active fire fighting. "Fighting" the effects of a widespread persistent chemical hazard of VX will place fire fighters in SCBA respirator protection for extensive periods. Recommend future NIOSH and OSHA CFRs incorporate NFPA concerns and the concerns of the law and ems communities. For example, OSHA 29CFR1910 does not accurately address the respiratory needs of law enforcement personnel and emergency medical services. Law enforcement agencies need a specific paragraph in Department of Health and Human Services CFRs and OSHA CFRs that clearly identify respiratory requirements. Using an industrial hazmat approach for law enforcement personnel is cumbersome.

- b. Recommend NIOSH publish a CFR annex that defines a Respirator Selection Guide for Radiological particulate, Chemical Warfare agents, Biological agents and Toxic Industrial Materials.
- c. The three GB scenarios developed by OLES, DOJ identify the most probable locations of an attack in the US. These scenarios need integrated into Federal CFRs training paragraphs as recommended training standards for responders.
- d. Since many viruses are smaller than 0.3u, negative pressure P100 filter media needs expanded to the next level. A level that stops the average micron size of a gelatin virus conglomerate. NIOSH, OSHA and CDC need to generate new protocol that will allow NIOSH to address biological agents and not just normal inactive particulate.
- e. A class of concentration bench test levels is warranted due to the fact that chemical warfare agents could be present in militarily significant concentrations or dilute concentrations (Tokyo, 30% GB). Service Life of negative pressure canisters under concentrations of 4,000, 2,500, 1,000 and 500 mg/m³ would greatly benefit the respirator protection program manager of a responder agency.
- f. Statistically significant sample numbers for NIOSH live agent approval criteria should be standardized per agent exposure, respirator system and respirator filtering device. Initial sample numbers should be in the 6-10 quantity but to maintain NIOSH approval lot number samples of 10 each should be submitted to NIOSH for testing and approval on a agreed upon production cycle per manufacturer projections. The concept of 16 respirators per submission for NIOSH approval under NBC conditions is significant. Providing 22 - 32 canisters per submission for NIOSH approval under negative pressure canister protocol is significant as well.
- g. Donning Times for respirator systems should be integrated into CFR training guidance as a standard to ensure medically evaluated operators can don the systems in adequate time to protect against exposure. Donning Times are situation dependent and fall into Before, During and After "Attack" situations/classes. Minimum donning/clearing time for a standard negative pressure respirator should fall in the 3 to 9 second timeframe. Additional time should be allocated for SCBA positive air flow actions, PAPR clearing and air flow start actions and accessory shroud fitting actions over the respirator after it is donned.
- h. Simulants should be used as pre- submittal tests for product performance assessment only. Live Agent exposure tests should be the final approval performance assessment for all respirators and other PPE that seek NIOSH NBC approval.
- i. Assigned Protection Factors are needed. APFs should be determined in accordance with joint NIOSH, ANSI, DOD and OSHA input. This subject should not be held in reserve for a later publication. It must be published simultaneously with applicable CFR.
- j. Notional Test Matrix for Evaluating NBC Protective Respirators for Domestic Preparedness Applications requires live agent challenge testing on facepieces and eye lenses of all NBC respirators seeking NIOSH approval. Understandable

- speech communications parameters should be added under Human Wear Factors Testing for all Major Respiratory Categories.
- k. NIOSH/SBCCOM Respiratory Standards Health Effects/Breakthrough Concentrations Matrix should identify the Ict50 for GD not assume it is in the range of GA/GB. All Breakthrough values should be determined based upon the ideal carbon or known sorbent quantity that is ideal against TIMS, CW and off gassing from BW. Negative Pressure Canister dimensions may have to be mandated by NIOSH to achieve the minimum breakthrough concentration times. An average breakthrough time maybe 3.5 hours for a 240ml carbon canister but the actual breakthrough starts at 183 minutes/3.05 hours. That value of 183 minutes is the actual breakthrough start time so respirator program would look at a service life of 3.0 hours as a change out criteria time against 4,000 mg/m³ of GB.
 - l. Particulate load times for riot control agents, biological bacteria, toxins, virus and radiological dust should be standardized against specific micron sized filters. Under non-IDLH conditions load time and saturation time of pathogenic particulate on a filter media is critical in knowing when to change out that canister when it is exposed to toxic or riot control particulate. Again, dimensions of canisters play a role in the successful standardization of breakthrough load times.
 - m. Since WMD/NBC events are expected to be time and casualty intensive, service life data for hose assemblies, canisters, face blanks and inlet/outlet valves is required. For those responders that are contaminated but not exposed, decontamination operations will allow the disposal of their PPE, however, responders manning and conducting decontamination operations over long periods of time will require service life statistics.
 - n. WMD/NBC events are elusive in the fact of defining accurate levels of contamination. Most industrial workplace settings are engineered controlled. WMD/NBC settings are situational dependent upon the METT-T factor: Mission, Enemy/Threat, Time, Terrain and Temperature. Detection measures by responders play a critical role in respirator service life, accurate change out schedules, accurate response equipment configuration and accurate medical diagnosis. A chart of accurate NBC IDLH figures, PEL /STEL and TWA should be published in a NIOSH protocol CFR and industrial liked compounds should be compared to the chemical warfare agents factors. Parallels can then be drawn that support enhancing a respirator protection program.
 - o. Fit Testing protocol should mirror end user physical activities. In order for an accurate Fit Factor to be determined realistic exercises that have users go into heavy work load should be integrated.
 - p. CO₂ levels in PAPRs warrant further clarification from the perspective that they are or are not a concern for end users. SAR airflow exchange is significantly different than PAPR exchange. CO₂ levels standards in escape hoods/devices are a given.
 - q. Products that are already in use by responders for NBC respiratory defense cannot simply be outdated by new NIOSH NBC protocol. This would undo 6 years of civilian domestic preparedness. NIOSH should analysis previously done third party testing on these products, generate a position and establish a uniform

baseline of testing that will be acceptable. This would prevent manufacturers from absorbing undue retesting financial costs.

- r. Dual-purpose SCBA/APR respirator systems need NIOSH flame test criteria for canister serviceability and post fire agent exposure performance criteria.
- s. Next generation respirators integrated into a total responder ensemble, that is, in the words of Brigadier General Philip M. Mattox, Deputy for Acquisition and Readiness, Natick Soldier Center, the beginning of the Emergency Responder as a System provide foresight. NIOSH should allow provisions that support the integration of Heads Up Displays, external usage indicators and detection platforms into respirator systems and major end item total ensembles.
- t. 158 Chemicals will be published by NIOSH for NBC defense analysis. Total of 32 actual chemical warfare agents are part of the 158 chemicals. The challenge with this is that bio - engineering toxins next generation toxins from biological "organisms" should not be precluded from this list. Biology is now what Chemistry was 20 years ago, toxins that are chemical compounds should be considered under this 158 listing of chemicals. Ken Alibek confirms that a specific country has 8 Genetically Engineered strains. The toxins from these strains are of concern.
- u. Implementation by policy rather than by rule making is the ideal short-term fix for the big picture. If time frames become extended and protocol is not finalized and published, responders will continue with current military specified equipment. Certain responders will continue to maintain that they can enter a unknown NBC situation with negative pressure mask and canister, assume the risk/expense and accomplish the mission/ saving extensive numbers of lives.
- v. NIOSH joint venture memorandum of understanding between select agencies to pursue NBC standardization requires further agreement from other agencies such as the DOE, EPA and DOT. The DOE has a significant number of security contractors that provide NBC defense response in local state areas. The mission of recapturing a DOE site from a WMD terrorist cannot and should not be overlooked when it comes to respirator protocol standardization.

4. Pending your comments or questions.

End of Submission, Terrence K. Cloonan, 5/31/01, 4:45pm,
and Safety.

Scott Health